Mineral Resources . .

OF

Kansas.

	Per annum.
Lead and Zinc Ores, . . .	$1,000,000
Metallic Zinc, ...	2,250 000
Coal, ...	4,000,000
Building Stone, ...	500,000
Salt, ...	750,000
Plaster and Cement, . . .	350,000
Oil and Natural Gas, . . .	60,000
Clays, ...	250,000
Mineral Paints, ...	100,000
Grand total, . . .	**$9,260,000**

TN24
.K2M6

TJ24
.K2M6

2-20511

The Mineral Resources of Kansas.

Introduction.

It is our intention in these few pages to present in a plain and convenient form a few facts and figures concerning the great natural wealth our State possesses beneath her soil. The name Kansas, for years, has carried with it the thought of unsurpassed yields of wheat, oats, and corn; of broad prairies, studded with houses and barns of the agriculturist and stock raiser; of great pastures traversed by sparkling brooks and beautiful streams, the banks of which are continuously echoing and reëchoing the lowing of the herd, the bleating of the flock, and the neighing of the horse. But the world at large has no conception of our great mineral wealth, which, in the near future, is destined to place us in the front ranks as a mining State.

Not only are our ores and other products of the mine practically inexhaustible, but the variety of products our State affords is great. We have lead ores and zinc ores, with mammoth smelters for their reduction; we have coal, and salt, and gypsum; we have ochers of many kinds, from the light, golden ocher of the Saline river district, to the rich, heavy varieties of many other places; we have building stone of great variety and beauty scattered all over our State; we have clays of all grades, from the pure fire clay to the best grades for the manufacture of vitrified brick; we have asphaltum, and mineral oils, and natural gas, each of which has been found in limited quantities, with good indications that careful and intelligent investigation would reveal much more.

To any and all of these great natural resources we invite the

attention of capitalists. We pride ourselves, not so much on what we have done as in what the future has in store for us. We invite capital to visit us, firmly believing that she can reap rich dividends for herself, and knowing that at the same time our citizens and our State will also be greatly benefited. Our wealth is here in unlimited quantities, and we cordially invite you to come and share it with us.

For convenience we will follow the order given above in our descriptions. In the southeast part of the State, in the very corner, our lead ores and zinc ores are mined. Almost within a stone's throw, it would seem, to the northwest the vast deposits of coal are found, so that our great furnaces and smelters are most conveniently located just outside the mines. Farther to the west the salt and gypsum are found in quantities sufficient to supply the world for millions of years, and yet within easy reach of our coal fields. Our building stone is scattered as far and wide as the length and breadth of our fair State, while the oil and gas are confined to the eastern portions.

Lead and Zinc Mining.

$1,000,000 per Annum.

The only portion of our State which has produced any notable quantities of these ores is the extreme southeast—the vicinity of Galena, so that a description and history of Galena is a description and history of lead and zinc mining in Kansas. It was early in the spring of 1876 that a fortunate well digger in the Short creek valley chanced to make a rich discovery of lead ore in the place now known as Bonanza. Excitement spread like wildfire, and soon rich operators were becoming richer by the successful operation of their mines. The following spring, 1877, the same lucky prospector made a much richer "find" a mile further up the creek to the east, and from that day to the present time mining operations have been increasing, and the annual output has, in general, steadily advanced, until in 1892 the cash value at the mines of the total output was nearly a MILLION DOLLARS, and it now looks as though for 1893 the figures would reach a MILLION AND A QUARTER!

The ores occur in a limestone and a flint rock, or chert, but

principally in the latter, so that the waste from the crushing and separating mills is a very superior material for road making, railroad ballast, and the finer grades for sand to be used in plastering and masonry. Thousands upon thousands of car loads of this material are shipped from Galena every year, and each load leaves a certain amount of ready cash behind. But the beautiful little city of Galena itself deserves further description.

GALENA, situated in the county of Cherokee, in the southeast corner of the most southeastern county of the State, contains within a radius of three miles the richest lead and zinc deposits found in the United States. Galena, unpretending and unassuming, has risen from a mining camp, in 1877, with tents and shanties for dwellings, to a first-class little city, with all the comforts of modern civilization—good streets, waterworks, electric light, substantial business and dwelling houses, opera and public-school buildings; and its business men, mine operators and miners, mechanics and artisans, are a class of people liberal hearted and social, whose energy and push and money-making faculties have become proverbial.

The city and adjacent ground now being mined has a population of 6,000, and the disbursement of from $15,000 to $30,000 every Saturday evening (pay day) from the sale of lead and zinc ores distributes wealth and happiness among its people.

We copy the following description of Galena from the *Illustrated West and South*, issued in 1892:

"South of Short creek, on the hillside, lies Galena, with its 5,000 people, imposing public-school buildings, its stately water tower, handsome opera house, far-reaching business avenue, never-ending and ever-changing panorama of derricks, shafts, concentrating mills, crushers, jigs, steam pumps, flumes, smelters, sludge mills, foundries, engine houses, smokestacks, railway sidings, cars, dumps, endless and interminable piles of rock, gravel, and mineral, and endless movements of mineral-laden wagons and carts, that mark to-day the busiest and most prosperous town in the 'Sunflower State,' and doubtless the richest lead- and zinc-mining town in the Southwest. In proof of this strong statement, it is estimated, on good authority, that within less than 15 years, or during the mining history of this camp, upwards of TWELVE MILLION DOLLARS' worth of lead ores and zinc ores have been mined and marketed within a radius of 2½ miles of the Galena post office.

In this connection, I beg to remind the reader that if the present value of zinc ores had obtained through the earlier mining operations on Short creek, when that now valuable commodity was practically worthless and went into the waste dumps, the grand total value of the mineral output would have closely approximated $20,000,000.

"While single mines in other districts, like that of the Center Creek mine at Webb City, have been very remarkable for output, no camp, or local district, in all the famous lead- and zinc-mining experience of the country presents a parallel to this locality either in respect to the general success of mining enterprise or the comparative uniformity of richness of the territory thus far developed. On all of the principal mining properties, varying in extent from 10 to 200 acres, that constitute the Galena district so far as developed, rich finds have rewarded a large per cent. of the operators. To uncover paying or rich mineral in Galena is not a matter of good luck altogether, as in many other districts. Every tract so far developed has handsomely paying mines, from the marvelously rich lodes of the Southside Mining and Manfacturing Company, within a stone's throw of the business quarter, to the Stanley camp, 2½ miles southwest; eastward a full mile, to the new works at the State line; northward, over and beyond the Empire City tract, and well to the southward, extend the golden lines of steady and increasing production, and from present indications it is only a question of time when the mining radius will have doubled and the output doubled in quantity.

"They are mining everywhere at Galena; out on the hills, along the slopes, down in the low-lying valleys, in the fields and woods, and under the very town itself. The entire town site is laid in mining lots of 200 feet square, and they are all under lease to practical miners. Better still, most of them are under tribute to the miner's pick and shovel for 52 weeks of the calendar year, and for 300 days of the year more or less mineral is lifted from lodes and levels that reach out under every part of the city.

"The mining, crushing, smelting and shipping of lead and zinc ores are the all-absorbing occupation of the day and location. They are the disturbing element in Galena mathematics, and enter into the calculations of the landowner, money lender, merchant, lessee, and home builder, the prayers of the clergy, the speeches of the politician, the glowing promises of the susceptible lover, the greed for land, and the love of gold.

"The race for fortune in Galena mining is not to the rich alone, or the poorest miner, whose only capital are his muscle, empty hands, pick, shovel, rope, windlass, and bucket, without a dollar of cash in hand, may secure a lease, sink his shaft, and in 10, 20 or 30 days, before his credit for provisions is exhausted, be paying royalties to his lessor on a lead of mineral that will make him from $2,000 to $10,000. With this stake he makes the most of his opportunities, and soon enough becomes a proprietary operator, with men, derricks, engines and other potent forces at his command. Not every miner attains this good fortune, but there are hundreds of instances in this district where poor men have acquired competency and fortune, with only good heart and muscle to begin with, and there will be hundreds of like instances to the end of the chapter. The entire district is as ample in opportunity to honest, earnest, persistent miners, as when the first shout of triumph was given by the lucky pioneers on Short creek, less than 15 years ago.

"Time and experience bring changes in every locality, in every enterprise. Fortunate, indeed, is that enterprise, the changes in which are always for the better. Galena can boast of that good fortune. The city is rapidly changing from the old mining-camp aspect to one of solid, new business houses and pretty homes. Henceforth Galena will be known and characterized as a city of beautiful homes, refined social life, and superior schools.

"The business quarter is undergoing equally marked improvement. Under the stimulus of good prices for mineral, every one of the dozen or more principal mining tracts in and about the city is in a state of unusual activity.

"The Southside Mining and Manufacturing Company, with a capital of $560,000, under the direction of Col. W. B. Stone, its chief owner and manager, is pushing work with great energy and success on its 160-acre tract adjoining the city. Of this tract, 80 acres have produced more zinc ore than any other tract of equal extent in the world. In 1888, this tract produced 45,459,910 pounds of rough zinc ore, 3,214,800 pounds of clean nugget zinc ore, and 1,272,971 pounds of lead ore.

"The new and rich discoveries constantly being made, and the new levels and lodes being opened, settle, beyond question, the enormous and permanent mineral wealth of this wondrous tract, which has already made money enough to found a dozen national

banks, and, under the sagacious and admirable management of Colonel Stone, is destined to double its present rate of production.

"The Galena Lead and Zinc Company is one of the wealthiest interested in the Galena region. It was the first company organized, and owns 340 acres of land, including the town site of Galena. The members of the company are: Ed. Zelliken, L. Risling, A. C. Spring, Hendricks Bros., and August Roos, with Peter Rice as superintendent.

"It is a valuable tract, producing largely of lead ore, and has made all these men rich. They now have about 126 shafts on the tract, and are turning out large quantities of lead and zinc ores.

"Conner & Brewster own and operate 80 acres southeast of the city, which has long been one of the best producers of the district. They have recently put in new machinery and enlarged their pumping plant, so that in the future theirs will be one of the most productive of any land on Short creek. They are now prospecting deeper than they have ever done before — below 100 feet — and find the ore in heavier lodes than any formerly found on this tract. This land has made a fortune for its owners, and is yet in its infancy as an ore producer.

"The Windsor Company owns 63 acres just north of Galena, in Empire, which is proving to be one of the most valuable tracts in the region. Its owners are: L. Risling, Ed. Zelliken, A. C. Spring, Dr. J. K. Williams, M. Robeson, and E. St. Geo. Noble. This land has been just recently developed, and is already one of the leading lead and zinc producers.

"The Maggie Taylor land, 40 acres, in the southeast part of the city, is one of the early pieces of land developed on the creek, and is one of the richest tracts in Galena, and has always been a profitable tract for the operators who have developed it, and has made a fortune for its owner, Mr. T. W. Bayne. More work is now being done on this land, and it will certainly be a leader in ore production in the future.

"The Illinois Lead and Zinc Company operates 40 acres 2½ miles southwest of Galena, in what is known as the Stanley district, and also 80 acres directly west of Galena, both being profitable tracts.

"The Cornwall Mining and Smelting Company owns and op-

erates 40 acres, in connection with the Maggie Taylor land, which, under the management of J. A. Walbert, has proven a rich producer.

"The Wyandotte Company is operating a 40-acre tract two miles southwest of Galena, which is proving a very profitable lead and zinc producer. Its owners are F. S. Boice, L. Haines, G. Schmuck, E. B. Schermerhorn, E. St. G. Noble, and Abe Schurl.

"A 120-acre tract, owned by E. Schermerhorn, 1½ miles southwest of Galena, has been developed in the last six months, and is one of the richest ore-bearing tracts in the district. More developments have been made on this land, and with better success, than any other tract of land in the same length of time. Two companies are operating it.

"Ol. Sparks, who has leased 10 acres of this land, has shown unusual energy and met with uninterrupted success in opening it. A dozen shafts have been sunk, and both lead and zinc have been found in every shaft. No other tract in Galena can show such a record.

"The Central Mining Company has 20 acres of the Schermerhorn land leased, and six acres of the Fry land, adjoining this on the east, making in all 26 acres of land, that almost equals the Ol. Sparks land in productiveness.

"The Ohio Lead and Zinc Company, owned by B. Cooley & Co., of Hutchinson, Kas., with W. T. Botkin superintendent, has shown large developments for a single year's operations.

"Fortunes in single lots, as heretofore noted, have not been at all uncommon in Galena. George Thompson, from a 25 x 100 foot lot, took out and sold $40,000 worth of lead ore. In 1889, Scott, Noble & Company, without going below the 40-foot level, took out over $19,000 worth of lead and zinc ores from a lot 100 x 100, on the Windsor land. The same year, George Anderson took out over $33,000 worth of ore from a single mining lot on the Galena land. From July, 1890, to January 1, 1891, over $40,000 worth of ore was taken out from the Bandana mine, on the Galena Lead and Zinc Company's land. Carney & Sons took out over $40,000 worth of ore from a single mining lot on the Galena Lead and Zinc Company's land. These are only a few instances where fortunes have been made on single lots. Many more could be given, but want of space forbids.

"But adjectives are much less powerful in their influence when

alone than when supported by facts and figures. We therefore beg the reader to carefully study the following tables, in order that the logic of facts and figures may substantiate the descriptions already given."

The following is the output of Galena for the years 1886, 1887, 1888, 1889, 1890, 1891, and 1892:

1886—Lead ore produced, 5,924,284 pounds.
Zinc ore produced, 31,768 tons.
Shipped 1,403 cars of gravel, at 3.19\frac{2}{3}$ per car.
1887—Lead ore produced, 6,152,380 pounds.
Zinc ore produced, 32,795 tons.
1888—Lead ore produced, 5,248,000 pounds.
Zinc ore produced, 33,391 tons.
1889—Lead ore produced, 7,985,000 pounds.
Zinc ore produced, 32,950 tons.
1890—Lead ore produced, 8,347,927 pounds.
Zinc ore produced, 21,675 tons.
1891—Lead ore produced, 7,204,420 pounds.
Zinc ore produced, 20,641 tons.
Gravel—cars shipped: W. B. Stone, 3,207, at $2.50 per car; other parties, 3,500. Total, 6,707.
1892—Lead ore produced, 14,376,340 pounds.
Zinc ore produced, 23,811 tons.
Shipped 5,246 cars of gravel, at $2.50 per car.

Work done by Concentrating Mills of Galena and Empire City, Kas.

CONCENTRATORS.	Rough ore milled, pounds.	Zinc ore produced, pounds.	Lead ore produced, pounds.
James Murphy, No. 1	23,161,090	5,277,510	217,590
Robt. Crowe	21,374,200	6,324,840	96,710
Galena Lead and Zinc Company	17,764,840	5,006,430	237,360
James Murphy, No. 2	11,658,230	2,261,800	107,149
W. B. Stone, No. 1	9,014,310	1,407,110	84,250
W. B. Stone, No. 2	7,457,040	2,179,340	103,240
Murphy & Murphy	6,875,550	1,778,940	58,430
Clement Company	4,138,370	874,410	64,190
B. Cooley	2,024,410	359,660	15,920
Emmons & Miller	*	413,990	38,720
Wyandotte Company	4,075,000	664,820	54,630
The Day	1,590,250	450,450	26,890
Vest & Co	746,000	123,000	6,780
Totals	109,879,290	29,123,500	1,111,850

*Not reported.

Itemized Report.

Of Lead and Zinc Ores from the Galena and Empire City Mining District, for 1892, from Advance Sheets from the Kansas State Report on Mines and Mining.

No. acr's.	NAME OF COMPANY.	Zinc ore, pounds.	Lead ore, pounds.
160	Southside Mining and Mfg. Company,	7,985,910	2,386,008
60	Central Company	5,757,210	1,980,035
320	Galena Lead and Zinc Company	4,759,140	2,061,852
40	Battlefield Company	2,944,585	1,044,585
10	Ol. Sparks Company	2,260,735	677,417
9	Ohio Lead and Zinc Company	2,330,200	1,033,170
30	J. M. Cooper Company	1,637,675	1,475,901
20	Crystal Mining Company	905,817	1,000,451
10	Sonneberg Mining Company	1,403,920	233,010
40	Templar Mining Company	748,130	115,345
63	Windsor Mining Company	876,050	122,048
40	Empire Mining Company	899,032	196,412
40	Illinois Mining Company	767,525	153,887
40	Cornwall Mining Company	677,630	113,680
40	Maggie Taylor Company	151,540	95,340
40	Annie Laurie Company	453,180	64.080
10	Queen Bee Company	298,800	10,080
40	Grace Clark Company	66,090	72,070
40	Folmer Land Company	64,000	59,314
12	Harrelson Mining Company	14,860	169,390
10	Fahlenbock Company	.....	4,020
40	Log Cabin Company	.....	133,310
10	Mississipi Company	.....	114,650
	Galena lots, W. B. Stone	.....	121,145
	Neutral lots	12,720,749	1,039,140
	Totals	47,623,778	14.376,340

Zinc ore, value of	$476,237 78
Lead ore, value of	301,903 14
Total value of ores	$795,350 92
Gravel shipped, 5,246 cars; value, $2.50 per car	13,115 00
Total value of mine production	$808,465 92
Value of lead ore per 1,000 pounds	21 00
Value of zinc ore per 2,000 pounds	20 00

Statement of Output of Ore.

RETURNS FROM THE MINES OF THE LEAD AND ZINC DISTRICT OF SOUTHEAST KANSAS, FOR WEEK ENDING MAY 28, 1893.

GALENA AND EMPIRE CITY, KAS.

	Lbs.	*Lbs.*
Perry	42,840	.....
Murphy No. 2	132,220	.....
Galena Lead and Zinc Company	281,470	.....
Murphy & Murphy	97,050	4,500
Emmons & Stewart	151,750	.....
Emmons & Miller	270,000	.....
W. W. P. Clement	53,340	44,100
Southside Mining Company	18,510	.....
Galena Lead and Zinc Company	49,330	.....
Ohio Lead and Zinc Mining Company	22,070	3,540
Illinois Lead and Zinc Company	4,000	.....
Boice, Schmuck & Co	23,510	.....
Templar Company	18,640	760
Ol. Sparks Company	20,960	10,050
Grace Clark Company	172,960	.....
Central Mining Company	19,740	17,450
Battlefield Mining Company	120,000	500,000
Crystal Company	15,000	17,000
Sundries	290,710	.....
Totals	1,845,000	590,400

Value, $31,538.

It will be seen that thus far in the year 1893 the mineral output is much greater than at any previous time in the history of Galena, substantiating the belief that our mines are continuously becoming better.

Opportunities for investment are as ample and promising as at any period in the history of local mining. The visiting capitalist, desirous for investment in lands or leases, pays more for less acres than the fortunate purchasers of an earlier day, when only superficial mining and fluctuating values of mineral gave guaranty of profit on his investment; but he has the advantage of the more certain, secure and ample returns growing out of the better markets and higher prices for mineral and more thorough and improved methods of mining. Indeed, there is hardly a chance for failure to the investor in mineral-bearing lands at current values anywhere in the district.

The steady advance in land values and leases has been so

marked, steady and strong for the past five years, and so evidently in keeping with the rapidly-increasing output of mineral, consequent upon the later and better methods and appliances of mining, that the investor, though blindfolded, might safely place almost any amount of money in lands or leases, with the certainty of doubling his capital in three years. Behind him are a dozen years of crude and superficial mining, resulting in as many million dollars' worth of mineral, with few serious drawbacks to the camp and city. Before him is a rich, round, full century of deep, systematic, thorough mining from lower levels, disclosing a wealth of mineral never dreamed of by the older miners, and rich in golden promise to the city and district.

Zinc Smelting.

$2,250,000 per Annum.

The proximity of the rich Kansas coal fields to the southwest Missouri mining district caused the erection of zinc smelting works at Weir City in 1873, long before zinc ore was mined in the State. With the increasing market for spelter (metallic zinc), due largely to the extra demand for galvanized sheet iron and iron wire, the zinc industry has increased with wonderful rapidity during the last quarter century.

One of the peculiar properties of zinc ore, which places it in strong contrast with lead ore, is the difficulty with which it is smelted, or reduced to the metallic state. An average of three tons of coal is required to smelt one ton of the ore, and therefore our zinc smelters are nearly all located in the coal-mining district. From the small beginning of the four furnaces erected at Weir City in 1873, the number has steadily increased, until at the present time no less than 76 furnaces are now located in the State. When in active operation a furnace will yield from 2,100 pounds to 2,750 pounds of spelter per day. During the past year the combined output of our furnaces reached over 56,000,000 pounds, or more than 28,000 tons, which had a cash value at the smelter of fully $2,250,000.

In the creation of this enormous value, over 56,000 tons of ore were used, a great portion of which came from our own mines;

from 160,000 to 170,000 tons of coal were consumed, which placed fully $350,000 in the hands of our coal operators from this source alone; 1,200 men were directly employed at wages which averaged not less than $2 per day, making about $430,000 paid out for wages. Deducting the value of the raw material—ore and coal—it will be seen that there is fully $1,000,000 per year left for wages, repairs, etc., which represents the actual amount of money brought into our State by this one industry. This, added to the $1,000,000 a year for the product of the lead and zinc mines, and the more than $2,000,000 a year for the coal output in Cherokee and Crawford counties, makes the southeast part of Kansas almost the richest mining country in the world.

It will probably be a great surprise to many to learn that Kansas—the great agricultural and stock-raising State of Kansas—occupies so important a place in the mining and metallurgical world. But such is the case. Pittsburg, Kas., is to-day the greatest zinc-smelting town in the world, with Weir City a close follower, while Girard, Scammon and Galena are following not far behind. Illinois is the only other State that at all compares with us in zinc smelting. According to the tables given in Doctor Day's "Mineral Resources of the United States" (a governmental publication), during the first six months of 1892 the spelter output for America was as follows:

	Short Tons.		*Short Tons.*
Illinois	15,483	Eastern and Southern States	6,901
Kansas	14,161		
Missouri	8,954		

It is learned unofficially that during the last half of the year our increase was sufficient to place us ahead of Illinois for the year, making us the leading State in the Union for the production of spelter. It will be seen from the above table that we produce nearly one-third of all the spelter of America. The output in foreign countries in 1891 was about 320,000 short tons, as against 91,000 tons produced by America. It will therefore be seen that fully one-fourteenth of all the zinc produced in the world is smelted on Kansas soil.

Coal.

$4,000,000 per Annum.

Nineteen different counties in Kansas produce marketable coal, with an aggregate annual output of about 2,753,725 tons, which has a cash value at the mines of nearly $4,000,000, for the production of which 8,950 men are employed annually. The coal is all bituminous, or "soft," coal, and occurs in veins from 20 inches to 60 inches in thickness. The best coal bed is in the southeast part of the State, and is known as "Cherokee" coal. It is extensively mined in both Cherokee and Crawford counties, which produce over 60 per cent. of the total output of the State. Further to the north and west one meets with numerous other beds, such as the Fort Scott coal, the La Cygne coal, the Pleasanton coal, the Osage City and Scranton coal, and the Leavenworth coal. The coal seams at Leavenworth and Scranton are about 22 inches thick, while the Cherokee coal vein is 42 inches thick upon the average, and much thicker in places.

Although 19 different counties are coal producing, four counties produce over 93 per cent. of the whole output. In 1891, the rank was as follows: Crawford, 33.56 per cent.; Cherokee, 32.50 per cent.; Osage, 17.10 per cent.; and Leavenworth, 10.60 per cent.

As zinc smelting, salt refining and other manufacturing interests increase, the demand for good, cheap fuel has a corresponding increase, and our bounteous supply of coal meets every demand. The following table, taken from the last report of the State Mine Inspector, illustrates this:

	Tons.		*Tons.*
1885	1,440,057	1889	2,152,760
1886	1,390,000	1890	2,516,054
1887	1,570,079	1891	2,753,725
1888	1,700,000		

The estimated value of the output for 1891 is $3,946,920. According to the statistics given in "Mineral Resources" for 1891, there are but 10 States in the Union which have a heavier annual output of bituminous coal than Kansas, and but *seven* the output of which has a greater market value at the mines. Indiana, Maryland and Kentucky each has a little heavier annual

output than we, but their proximity to the great coal fields of Ohio and Pennsylvania affects the price of coal. But the greatest surprise is met with by comparing ourselves with our neighbor, Missouri—the great mining State of Missouri! Not only do we almost double her output of spelter, but our coal fields surpass hers in annual output year after year, both in quantity and value.

The area of our coal fields is confined to the eastern third of the State, many portions of which have been so poorly prospected that there are many chances for valuable beds of coal yet to be discovered. Just as this article is going to press, a report comes that a vein of good coal has been discovered in Anderson county. Whether this report should prove to be true or not, it indicates what the possibilities are, for any portion of the 20,000 square miles or more above mentioned is liable to become coal producing. A little money expended in judicious prospecting almost certainly would yield good returns.

The quality of our coal is fully equal to the average soft coal produced in the Mississippi valley. The chemical composition of the Cherokee coal compares very favorably with the Pittsburg, Pa., bituminous coal, as is shown by the following analysis made by Prof. E. H. S. Bailey, of the State University:

	Cherokee.	*Pittsburg, Pa.*
Water	1.94	1.31
Volatile	36.77	36.61
Fixed carbon	52.45	54.17
Ash	8.84	7.91

The steam-producing power of the Kansas coal has also been elaborately tested by Professor Blake, of the State University; an average of tests of nine different samples gave the figures 13.51. The best Indiana block coal gave a result of 14.43. These figures confirm the statement that our coals are good steam producers.

Coke.—But little coke is made in the State, excepting that required for zinc smelting, yet we rank twelfth as a coke-producing State. In 1891 our product was worth $33,000. For the manufacture of this more than 27,000 tons of coal were used—mostly slack, which until recently has been thrown away. The per cent. of coke a coal will make is a good test for the quality of the coal. The summaries given in "Mineral Resources" shows that the average per cent. of coke obtained, during a period of 12 years, is 59.75 per cent., with a maximum of 65 per cent., and a

minimum of 52 per cent. This showing compares very favorably with coking coal from other places.

It will be seen from the above that the coal mines of Kansas have a very heavy output, and that the yield is rapidly becoming greater; that we are already in advance of three-fourths the States and Territories as a coal producer; and that the average of our coal has a quality equal that of the best coal in the Mississippi valley. Our broad domain of unexplored lands invites you to come and investigate them.

Building Stone.

$500,000 per Annum.

Kansas is well supplied with building stone. The principal varieties are sandstone, white limestone, and a very compact limestone, susceptible of a high polish, which locally is often called marble. The sandstones and shaly limestones are most noted for the excellent flagstones they produce. In many places in Cherokee, Bourbon and other counties, sandstone flags can readily be obtained 30 feet square, and almost as smooth as a floor, could proper mechanical devices be obtained for handling them. Such layers of rock vary from two to six inches in thickness, and in places are found one layer above another for a depth of 15 or 20 feet. In other places the sandstone layers are much thicker, so that they can be worked for dimension stone to a good advantage. A particularly fine building, erected from such stone, is the bank building in Columbus, Cherokee county.

The limestone of the State is much more abundant than the sandstone. The coal-measure area of the eastern portion has several different beds of good stone, the best of which, perhaps, is the subcarboniferous crinoidal limestone of Galena. This excellent rock is used locally for foundations and other similar purposes, but is worthy of much more extended use. It is the most solid, compact stone in the State, and occurs in beds four to eight feet thick, so that it could be worked to good advantage for dimension stone.

West of this, the most notable limestone bed is the one worked extensively at Lane, in Franklin county, Iola, in Allen county, and in other places. The rock is a compact limestone, which

makes excellent dimension stone, and takes a fine polish, for which reason it is often called marble. The most extensive quarry is at Iola, where many thousand dollars' worth of stone are quarried annually.

Still farther to the west, the famous Cottonwood Falls limestone is found. This is the most extensive limestone bed in the State, and can be traced as one continuous formation across the State from north to south. In different places it furnishes a most excellent building stone, while at intervals it is not so valuable. It is worked extensively at Manhattan, Junction City, Alma, Strong City, Florence, Augusta, Winfield, and Arkansas City, and good quarries could be opened in many other places.

Beyond this, to the west, limestone and sandstone of different grades are worked locally to a considerable extent. In some of the western counties, where such stone is easily obtained, fence posts are made of it for building wire fence. When passing through these portions, one can easily see from the car window many miles of such fencing, the regular size and form of the stone posts witnessing to the ease with which such stone can be worked.

It is exceedingly difficult to form reliable estimates of the value of the quarry output from year to year, on account of the large number of small quarries which supply local demand only. In "Mineral Resources of the United States," for 1891, the estimated value is $80,000 for sandstone, and $300,000 for limestone. It is quite evident, however, that this is much too small an estimate, for the reason given above. It is more nearly correct to place the figures for all kinds of rock produced in the State at $500,000. The main point which it is desirable to emphasize in this connection is, not how much has been produced, but how much *can be* produced. From the foregoing statements, it can readily be seen, that were enough capital invested, millions of dollars per year could be produced.

Salt.

$780,000 per Annum.

We have no excuse to offer for claiming that we have the largest and best deposit of salt in America. The south-central part of our State is underlain with 300 feet of salt. The area is known to contain at least 2,000 square miles, with a strong probability that it is much larger. The vastness of the area is such that the actual increase in the price of land known to contain salt is but little.

It was as recently as 1889 that the first Kansas salt was placed on the market, when about $200,000 worth was sold. The annual output has increased until 1892, when, it is estimated, no less than $780,000 was obtained from salt sales. The salt is all originally rock salt. At Kanopolis, Lyons, and Kingman, it is mined in this form; that is, it is brought to the surface in the solid form, just as it occurs in nature, and is sold in large lumps, for stock, or is crushed and sent into the market as grain salt. The Lyons Rock Salt Company perhaps has the heaviest output of this kind of salt. The capacity of their plant is 1,000 tons per day, but they reach only about one-fourth their capacity. Reckoning the salt at $1.25 per ton they have a daily output of $300, which is equal to $90,000 per year. The other rock-salt companies in the State probably equal this, making $180,000 per year for rock salt.

Much the largest amount of salt, however, is made by what may be called the "wet process." Holes are drilled into the salt and water forced down, which is again lifted after it has become saturated with salt. It is then evaporated, the same as brines usually are. The most extensive works of this kind are located at Hutchinson, although others can be found at Sterling, Nickerson, Kingman, Anthony, and Wellington. A liberal estimate places the output for this kind of salt at 1,000,000 barrels for 1892, which is worth about 60 cents per barrel at the factory. The $600,000 thus obtained is quite irregularly scattered, for about 90 per cent. of it goes to Hutchinson.

In the production of the 1,000,000 barrels, about $200,000 is paid out for labor, and $150,000 for coal—Kansas coal. The Kansas Salt Company, at Hutchinson, is making a specialty of

table salt, which they have named the R. S. V. P. The purity of the salt is such, and their methods of evaporation are so superior, that they have succeeded in producing a table salt which will not gather moisture nor cake, a difficulty which has heretofore always bothered salt consumers. The Hutchinson Salt Company is making a specialty of dairy salt. It has been thoroughly tested, both by chemical analysis and by placing butter salted with it in cold storage for three, six and nine months, which is one of the severest tests that can be given dairy salt. In every instance it has stood the test so well that it can be said that no superior dairy salt can be found on the markets.

The salt in its natural condition is unusually pure. Chemical analysis has shown that some of it has as much as 99.87 per cent. pure salt, with an average for the mass as it is brought to the surface of considerably over 97 per cent. The nature of the impurities, too, is important. If a salt has much magnesium chloride, or calcium chloride, it will attract moisture from the air, or "sweat." Kansas salt has surprisingly little of either of these, so that it is perfectly dry in most climates. This is well illustrated by the rock salt from Lyons which is now on exhibition at the World's Fair, in the mining building. Although unloaded in the rain, during the unusually damp weather at the last of April, the mammoth-sized pieces have all dried off, and now are perfectly dry. No better recommendation for the salt could be given.

Kansas has salt enough to supply the world for a million years.

Plasters.

$350,000 per Annum.

To those well informed on the subject it would be no surprise should the future demonstrate that one of the greatest repositories of wealth in the State is to be found in the vast deposits of gypsum so extensively met with in Kansas. So far as quantity and quality are concerned we can supply the world for centuries. Gypsum is found almost everywhere over the central and western part of the State, from the north to the south line. It is already profitably worked into plaster in many different places, and yields a heavy revenue to our State. Accurate figures have not been

compiled, but a conservative estimate would be that no less than $350,000 worth of the different kinds of plaster is produced annually, with a steady increase from year to year.

The works now in operation are located in different places along the eastern limit of the gypsum beds, from Blue Rapids, near the north line of the State, to Medicine Lodge, in Barber county. At Blue Rapids, the output has increased from 20,000 barrels in 1889, to 30,000 barrels in 1892. At Hope, the Hope Stucco Works have a daily capacity of 20 tons, and the factories at Swayne and at Dillon produce about the same amount. Near Salina, two companies are in active operation, the Acme, and the Salina Plaster Company. The former of these ships its products, in car-load lots, to points as far away as Boston, New York, New Orleans, Oregon, British Columbia, and Canada. Its output is by far the heaviest of any in the State. The Salina Plaster Company was but recently organized, but it probably will do a very extensive business. At Medicine Lodge, a company is manufacturing an American brand of the celebrated Keene cement, which differs from ordinary plaster of Paris in being much finer, much more slowly to "set," thereby giving opportunity for better work, and in producing a superior wall, one that will not so readily crack or become dull. They are introducing it into all of our large cities for large and fine buildings, and therefore their output has been governed entirely by their ability to get the leading architects to adopt it. It is gratifying to learn that they have finally succeeded in placing it upon the market in such a manner that it will be sure to stay. In support of this view the following figures may be given.

Best's Keene's cement produced in 1891	203 tons.
Best's Keene's cement produced first half of 1892	345 tons.
Best's Keene's cement produced second half of 1892	490 tons.
Other products by same company, 1891	147 tons.
Other products by same company, 1892	565 tons.

Everything indicates that their output for 1893 will far surpass that of 1892, so that the one firm will likely do a $50,000 business this year.

When it is remembered that there are scores of locations almost if not quite equally favorable for the location of cement factories, one can readily form some idea of the vast possibilities for capital invested in this line. Our gypsum, of the purest varieties,

exists in beds from 10 to 60 feet thick, and can be blasted and quarried the same as stone, so that anyone can readily supply himself with the raw material.

Oil and Natural Gas.

$60,000 per Annum.

Thus far in our history we have made but little claim to being a producer of these two products. But prospecting during recent years has shown, unmistakably, that we possess them to a certainty, and quite probably in sufficiently great quantity to be of vast commercial importance. For over 20 years a few wells have been producing gas. Our knowledge of the existence of oil in our State is nearly half as old.

Paola, in Miami county, is the center of the oil fields. Quite a number of wells have been bored in that vicinity, different ones of which have produced a good quality of heavy oils. In 1889, there were produced 500 barrels; in 1890, the number had increased to 1,200 barrels, and during 1891, no less than 1,400 barrels were produced, with a cash value between $9,000 and $10,000. This is a small sum when compared with the product of Pennsylvania or Ohio, but it clearly indicates that our State may yet become noted as an oil producer.

The natural gas seems to be most abundant, and correspondingly of greater value. It is found over a considerable portion of the southeast part of the State, and is now in extensive use in Paola, Cherry Vale, Osawatomie, Iola, Humboldt, and Coffeyville, replacing other fuel in the kitchen, parlor, workshop, and factory. A liberal estimate is that it replaces not less than 15,000 tons of coal annually at present, with fair prospects for its rapid increase in the near future. The best wells in the State have been bored during the last 12 months, some of which give a pressure of over 200 pounds per square inch. One well at Cherry Vale has yielded as high as 4,750,000 cubic feet per day. It is generally admitted that the new wells at Coffeyville are the most productive in the State.

With such flattering results already obtained, what may we reasonably hope for the future! It is not a remote possibility

that the great mining, manufacturing and smelting interests, already described as being so prosperous in southeastern Kansas, will soon be stimulated by the mighty roar of the gas well, and that commercial prosperity resulting therefrom will spread its beneficial influence all over the State.